ROLE OF NEUROPEPTIDE TRANSMISSION IN INDIVIDUAL RESPONSIVENESS TO NOVELTY. P. Kalivas, M. S. Hooks and G. Hanson. Alcohol and Drug Abuse Program, Washington State University, Pullman, WA and Department of Pharmacology, University of Utah, Salt Lake City, UT

Exposure of rats to a novel open field initiates exploratory motor behaviors. There is extensive variability between individual rats in the intensity of the motor response elicited by novelty. Thus, a population of male Sprague-Dawley rats can be divided according to whether they demonstrate a high (HR) or low (LR) response to novelty. A number of studies have demonstrated that HR rats demonstrate a greater motor response and increase in dopamine transmission than LR rats in response to amphetamine-like psychostimulants. The differences in dopamine transmission are most marked in the mesoaccumbens dopamine system and a number of neuropeptides have been shown to modulate the behavioral influences of mesoaccumbens dopamine transmission. In the present studies, rats were screened for their locomotor response to a novel open field (Digiscan photocell chamber) and categorized as HR or LR rats. Three to 7 days later rats were decapitated and levels of mRNA for β-preprotachykinin, preproenkaphalin, dynorphin and neurotensin quantified in the shell and core of the nucleus accumbens. The only significant differences between HR and LR were lower levels of β-preprotachykinin and neurotensin mRNA in the core and shell, respectively, of HR. The peptide content of substance P and neurotensin was also determined in the shell and core. The levels of both substance P and neurotensin were greater in the core of HR and no difference was measured in the shell. These data indicate that there exist consistent differences between HR and LR rats in neuropeptide transmission in the nucleus accumbens. It is proposed that these differences may partly mediate the individual motor responsiveness to a novel environment.

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